Chapter 9

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LINUX 9.1 Understanding Jobs and Processes

- All tasks are started as processes
- Processes have a PID
- Common Process Management tasks include scheduling priority and sending signals
- Some processes are starting multiple threads, individual threads cannot be managed
- Tasks that are managed from a shell can be managed as jobs
- Jobs can be started in the foreground or background

LINUX 9.2 Managing Shell Jobs

- use command **&** to start a job in the background
- **while true; do true; done &**

- To move a job to the background
- First, stop it using **ctrl-z**
- next, type **bg** to move it to background

- Use **jobs** for a complete overview of running jobs
- Use **fg[n]** to move the last job back to the foreground

LINUX 9.3 Getting Process Information with ps

- **ps** stands for process and it will give more information about the running process
- The ps command has two different dialects: **BSD** and **System5.**
- **BSD** option didn't have a dash infront of it.
- **System5** option have a dash infront of it.
- Therefore **ps -L and ps L** are two completely different commands!
- **ps** shows an overview of current processes
- Use **ps aux** for an overview of all processes.
- **ps -fax** shows hierarchical relations between processes.
- **ps -fU linda** shows all processes owned by linda
- **ps -f --forest -C sshd** shows a process tree for a specific process
- **ps L** shows format specifiers
- **ps -eo pid,ppid,user,cmd** uses some of these specifiers to show a list of process and also shape the cmd.

LINUX 9.4 Understanding Memory Usage

- Linux places as many files as possible in cache to guarantee fast access to the files
- For that reason, Linux memory often shows as saturated
- Swap is used as an overflow buffer of emulated RAM on disk
- The Linux Kernel moves inactive memory to swap first
- Use free -m to get details about current memory usage.

LINUX 9.5 Understanding CPU Load

RunQueue

Some Taks **SomeOther Tasks**

Pid238
Pid239
Pid240
Pid241

Scheduler

CPU 1 **CPU 2** CPU 3 **CPU 4**

- **uptime** it show upto how long the process and showing the current laod average.
- **12:51:04 up 13:50, 3users , load average : 0.00, 0.00, 0.00**
- last three identity shows that average for last 1 min and average for last 5 min and average for last 15 min.

- start a process in background
- **dd if=/dev/zero of=/dev/null &**
- **watch uptime** it will show dynamically changes the load on cpu
- **lscpu** it will helps us to show information about the CPU's
- if more Core then our CPU is better to run process simultaneously

LINUX 9.6 Monitoring System Activity with top

- **top** is a dashboard that allows you to moniter current system activity.
- **Atop and Htop** are also there but recommend to use only **top.**
- Press **f** to show and select from available desplay fields.
- type **M** to filter on memory usage.
- Press **W** to save new display settings.

- **top** command when you use the output is :
- **first line** is the uptime command output.
- you can see how long this system has been up
- you can see the current amount of logged in users and load average
- the second line show how many task are running on this system.
- **zombie task** are those task which is through the bad programming and now communicate with parent task.
- **third line** show the information about the CPU's if you press 1,2,3 and so on the it will change the CPU information
- **us** stand for user space
- **sy** stands for system space
- **ni** stands for nice value which is change for the priority
- **id** stands for idle value the no. of percentage whent the cpu is idle
- **wa** stands for waiting time for the system for IO device
- **hi** stands for hardware interrupt which is time when the system is wait for the hardware
- **si** stand for stolen time

- There are many field which is **not show** here so you can press **F** then all the fields are available are here
- **use down and up key** to use it and press **space bar** to select it properly
- Then press **Q** to get out of it.
- Press **W** will write the current Top display setting to a file with name Top RC file in the current user home directory.
- we can also manage what our system is doing
- **K command** send you to a signal to the process and just press enter you will send signal to the most active process,
- alternatively you may specify the PID os the process you want to send the signal
- Now you want to decide which signal you want to send by default signal key is 15
- which is the polite way of asking the process to cease it's activities
- Another command is **R** for renising the processes

LINUX 9.7 Sending Signals to Processes

- A signal allows the operating system to interrupt a process from software and ask it to do something
- Interrupts are comparable to signals, but are generated from hardware
- A limited amount of signals can be used and is documented in man 7 signals
- Noy all signals work in all cases
- The kill command is used to send signals to PID's
- you can also use k from top
- Different kill - like commands exist, like pkill and killall
- signal 15 is to stop the process
- signal 9 is used to kill the process

- kill --help | less
- ps aux | grep dd
- kill -9 14273

- signal 15 with stop the process in polite way and just clean the screen and kick out through the top command
- signal 9 will kill the process in a very bad way and not clear screen

- pkill --help
- killall --help

LINUX 9.8 Managing Priorities and Niceness

- By default, Linux processes are started with the same priority.
- In kernel land real-time processes can be started which will always be handled with highest priority.
- .To change priorities of non-realtime processes, the nice and renice command can be used.
- Nice values range from -20 to 19
- -ve means processes will claim more CPU cycles (an increased priority)and +ve means processes will be nicer to watch other processes and claim less CPU cycles(decreased priority).
- Users can set their processes to a lower priority , to increase priorities you need root access.

- NI -Nice value (priority -20 higher priority)
- Kernel processes should go before ordinary user processes.
- RT -Real time(go before anybody can't be managed)

- R from top
- K for kill

- nice --help
- nice -n -1 dd if=/dev/zero of=/dev/null &

- renice --help
- renice -n 10 14740

Linux 9.9 Using Tuned Profiles

. tuned is a service that allows for performance optimization in an easy way.
. Different profiles are provided to match specific server workloads.
. To use them, ensure the tuned service is enabled and started .
. tuned-adm list will show a list of profiles.
. tuned-adm profile <name > will set a profile.
. **tuned-adm active** will show current profile.

• Practical
-systemctl status tuned

Thank you